

ABSTRACT OF THE DISCLOSURE

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An optical brancher branches an input optical signal into two. An optical detector converts one optical signal branched by the optical brancher into an electrical signal. A first controller generates a control electrical signal having a waveform obtained by inverting the envelope of the electrical signal. Based on the control electrical signal, an optical signal generator produces a dummy optical signal having a waveform λd and an amplitude $a/2$. The other signal branched by the optical brancher is delayed by a delay unit for a predetermined time, and then multiplexed by an optical multiplexer with the dummy optical signal from the optical signal generator. An optical amplifier amplifies a multiplexed optical signal. An optical filter separates an optical signal of a wavelength $\lambda 1$ from the amplified optical signal. Thus, optical signal amplification can be carried out without optical surges.

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